ANNUAL REPORT

for the fiscal year ending March 31, 1987

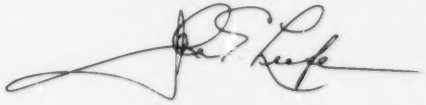
Department of Fisheries

To His Honour
The Honourable Alan R. Abraham, C.D.
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour to submit herewith the Twenty-Third Annual Report of the Department of Fisheries, for the fiscal year ending March 31, 1987.

Respectfully submitted,



John G. Leefe
Minister of Fisheries

To The Honourable John G. Leefe
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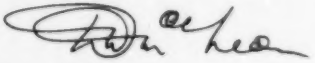

D.A. MacLean
Deputy Minister

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THE FISHING INDUSTRY

Total landings of commercial marine species in Nova Scotia increased slightly in 1986.

Fishermen in the province landed 463,349 metric tons of fish, shellfish and marine plants in 1986. This represents a 0.5 percent increase over the 1985 catch of 461,234 metric tons. The landed value of all species increased 35.6 percent to a record value of $423.9 million from $312.7 million.

Lobster again placed first as the most valuable species in 1986, returning $140.6 million to fishermen. Cod was second with a landed value of $83 million, while scallops provided $63 million to fishermen in that sector of the industry.

The groundfish and shellfish sectors of the fishery posted increases in landings with gains of 2.8 percent and 30.4 percent respectively. The pelagic and estuarial sector showed a decline of 23.2 percent in weight in 1986.

The Department received management responsibility of its inland fishery, excluding salmon, from the provincial Department of Lands and Forests. Aquaculture hearings were also implemented in the last fiscal year—to allow residents of proposed aquaculture sites to express their views and opinions.

INDUSTRIAL DEVELOPMENT

The Industrial Development Division promotes the further development of fish quality, infrastructure, safety and operational efficiency in the fishing industry through technical and financial assistance programs.

Financial assistance provided by the division was generally based on a 50 percent cost-sharing arrangement with the applicant, up to a maximum contribution of $15,000. Technical assistance was also available on request for projects undertaken by industry, with emphasis given to innovative projects or to new technological developments.

Technology Development—Fishing Vessels and Gear

In conjunction with processing facilities in the province, the department initiated a feasibility study on landing headless, gutted groundfish. The project entailed monitoring vessel efficiency, fillet yields and quality improvements. Initial results proved encouraging and the program will continue next year.

A controlled pitch propellor was installed on an inshore lobster/pair dragger based in Pubnico. The results of this project are very promising, although the cost may be prohibitive for most vessel owners.

A fuel monitoring system was also placed on this vessel and discussions with the owner indicated that fuel costs were reduced.

Two projects were undertaken on vessels to improve the usage of net storage reels. One project placed a drum on a moveable axis resulting in safer working conditions and more deck space. The other project provided funding for the first dual drum installation in the province. These two projects adopted many of the practices already in use on the eastern seaboard of the U.S., as well as overseas.

Technology Development—Shore Based Facilities

The technical staff continued to provide comprehensive guidelines and consultation services on construction practices for many of the shore-based incentive programs. Onsite supervision by the division's engineers is often necessary and they are assisted in the summer months by engineering students.

Heat pump fish-drying systems were equipped with monitors to determine the cost benefits to respective processing operations. Further information is available from the department.

Process monitoring equipment consisting of weighing scales connected to a central computer was one of the many demonstration projects organized this year. The system was installed in a plant for a three month period. Other processors were invited to observe its performance during that time. The host company was very pleased with the information generated and following the trial, purchased the system.

Product Technology and Process Development

Increased input continued this year in areas of fish waste utilization with emphasis on silage production and end use applications. Evaluations of groundfish and pelagic based silages for use in agriculture fertilizers and animal feeds produced encouraging results for further programming.

A project to produce smoked food products from herring carcasses also proved successful. The same materials were also used in a prototype mechanical smoker to produce an acceptable bloater in six days or less.

Further product development work took place in the Yarmouth area with the Northern Shark species, which was prepared into canned, smoked, headed and gutted products.

Financial Incentives—Harvesting

Emphasis was placed on safety and quality improvement programs with 151 applications being processed for the following projects.

Safety is of utmost importance to the division and this was evident by the continuation of cost-sharing for the purchase of approved liferafts. In total, 105 applications were processed.

In addition, the department approved ten applications to install halen fire fighting equipment on small inshore vessels.

Thirteen vessels were equipped with propellor nozzles to improve vessel efficiency. These projects were monitored by the department's technical staff.

Twenty-one vessel owners in the inshore dragger fleet were assisted in equipping their boats with safety-related net storage drums.

Assistance was provided to 14 applicants to equip their vessels with onboard lobster storage tanks.

Financial Incentives—Onshore Facilities

The program for improving available facilities in harbours around the coast consisted of three major areas: private wharves, marine haul-outs and fishermen's service sheds.

The fishermen's service shed program assisted in the construction of seven facilities in the province. Each shed was built to departmental construction standards.

Private wharf repair and new construction was carried out by fishermen's groups and local processors. Funding to a maximum of $15,000 was available to groups of four or more fishermen or registered fish plants for approved material. Other eligible applicants received a maximum of $10,000. During the year, 16 projects in this area were approved.

The department completed four cement slab haul-out facilities. Technical staff carefully evaluated the new facilities and provided follow-up services.

Much of the responsibility for electrical and water hook-up programs in 1986/87 was given to our federal counterparts in the Department of Fisheries and Oceans. However, the department did participate in five projects related to these improvements.

Financial Incentives—Processing

This program area continued to be the most active and visible in relation to fish products. More than 250 applicants received assistance under two distinct sub-programs. Fish handling containers, cool and cold storage facilities provided a means for industry to upgrade the quality of its products.

Three cool and cold storage projects were completed with both financial and technical assistance.

There were 198 fish handling container applications processed during the year. The bulk of these applications were requests from fishermen to install insulated containers onboard their vessels.

Nine boat freezer/trawl tub storage facilities were also constructed under this cost-sharing program. In addition, 34 applicants purchased high pressure cleaning equipment for use in their plants.

Canada–Nova Scotia
Economic Regional Development Agreement—Fisheries

The Fisheries Subsidiary Agreement between Canada and Nova Scotia was signed in October, 1984. The agreement has a total value of $50 million over five years. Federal and provincial expenditures will amount to $35 million and $15 million respectively. The program and budget structure are as follows:

	Five Year Budget ($000,000)	
Sector	**Federal**	**Provincial**
A. Quality Enhancement	21.0	1.5
B. Efficiency Improvement	10.5	6.0
C. Market Improvement	0.5	2.0
D. Resource Enhancement	1.5	5.0
E. Public Info, Evaluation and Administration	1.5	0.5
TOTAL	35.0	15.0

Funding for the Agreement was approved in August, 1985, in an interim amount of $28.5 million ($20 million federal, $8.5 million provincial) for the period 1985–86 to 1988–89. Depending upon a review to be completed prior to April 1, 1987, the remainder of the funding will follow in the amount of $21.5 million ($15 million federal, $6.5 million provincial).

The agreed division of program responsibilities between the federal and provincial departments of fisheries was based in part, on the primary areas of jurisdiction and responsibility of the respective governments in the fishery. Federal programs would tend to focus on harvesting and harbour infrastructure. Provincial programs would concentrate primarily in the areas of fish processing, product development, aquaculture and inland fisheries. It was understood that there would be some overlap in these areas; however the primary emphasis would be as outlined above. It was also established that most of the agreement would be implemented on the basis of joint federal–provincial planning of programs but with parallel delivery. That is, each government would implement its own programs but some cost-sharing would occur on selected projects.

Provincial projects are selected on the basis of the following criteria and order of priority:

1. Development—Generic
   Projects, including marketing and aquaculture development resulting in products or processes of benefit to the industry as a whole (e.g. utilization of waste products).

2. Development—Company Specific
   Research and development of primary benefit to a specific company (e.g. a new seafood product).

3. Technology Transfer
   Evaluation of technology developed elsewhere or in another sector but not yet utilized in Nova Scotia's fishing industry (e.g. reverse osmosis seawater desalinators).

4. Training Programs
   Includes the cost of providing training for new initiatives (e.g. dockside grading).

5. Public Facilities
   Government-owned infrastructure (e.g. hatcheries).

6. Incentive Projects
   Cost-sharing grants to encourage further use of equipment, facilities or processes proved effective to achieve specific objectives in the province (e.g. equipment related to quality improvement).

The following programs and projects were approved and completed during the 1986–87 fiscal year:

	Primary Responsibility	
	Federal	**Province**
Quality Enhancement		
Ice making and storage	•	
Electricity and water to processors	•	
Vessel fish hold upgrading	•	
Fish grader training		•
Clam industry testing		•
Fish quality evaluation S.W.N.S.	•	•

Efficiency/Improvement		
Semi-automated gutting machine		•
Consulting services to processors		•
Fish silage development		•
Heat pump dryer evaluation		•
Cryogenic chilling of fresh fillets		•
Fishermen's gear shed construction		•
Herring roe evaluation		•
Plant operations study		•
Silage based fish feed		•
Georges Bank oil and gas activity		•
Skidways and haul-outs	•	
Development of aluminum hulk for Atlantic fishery	•	
Market Development		
Mussel meat development		•
Sea urchin development	•	•
Nutrition poster		•
Scallop-in-the-shell		•
Health connection "Heart and Sole"	•	•
Culinary competition's seafood placemat	•	•
Summer seafood—retail campaign	•	•
Saltfish brochure	•	•
Omega-3 fatty acids	•	•
Resource Enhancement		
McGowan Lake trout hatchery		•
Potential bottom culture sites for scallops		•
Overwintering technologies for salmon culture		•
Temperature recording equipment		•
Salmon license buy-back	•	•
Site surveys—European flat oysters		•
Site surveys—Blue Mussels		•
Design of small scale shellfish hatchery		•
Culture technology—Bay Scallops		•
Promotional videos		•

Public Information, Evaluation, Administration

For the 1986–87 fiscal year, the provincial budget was $1.3 million and the federal budget was $5.3 million.

FISHERIES LOAN BOARD

During the 1986–87 fiscal year the number of approved loans continued to decline and the number of paid off loans continued to increase. The decline in approved loans is attributed directly to the lack of funding made available to the Board. The increase in paid off loans was due to a great extent on an improvement in the industry and the higher prices paid for fish. Repayment on the principal amounted to over three times the amount loaned. No boats were repossessed during the year. This was the result of the efforts of the loan administrator and the Loan Officers with respect to loans in arrears. Principal arrears at March 31, 1987 amounted to $2,854,725 which was only 47 percent of those at March 31, 1986.

Ten meetings were held during the year. Of the 237 applications considered, 105 were approved, 52 were rejected, two were deferred and 78 were returned, either because they did not qualify under the Board's regulations or because they were received after funding for the year had been allocated. A further 19 loans on the books of the Board were assumed by other applicants.

Gross value represented by the approved loans totalled $7,122,515 and after deducting down payments, total net loans amounted to $5,670,410.99. Two hundred ninety-nine loans were paid off during the year.

The following table compares Loan Board activity over the past five years:

Year Ending Mar. 31	Applications Received	Loans Approved	Net Amount Approved	No. of Outstanding Loans	Amount Outstanding
1983	435	225	5,475,263	2,234	108,460,960
1984	307	175	5,268,848	2,100	96,065,525
1985	231	121	3,972,682	1,966	84,994,445
1986	240	109	6,267,295	1,774	74,068,949
1987	237	105	5,670,410	1,555	62,450,835

In addition to the outstanding loans of $62,450,835 at year end, there were outstanding commitments of $269,776. Advances during the year amounted to $8,774,863 and repayments on the principal amount of loans totalled $17,219,577. A further $6,586,840 was received in interest. Write-offs during the year amounted to $2,173,400.

A breakdown of the types of loans approved is as follows:

	No.	Amount
New boats to 39'11"	24	$ 766,234.08
New boats 40' to 43'11"	15	1,148,295.13
New boats 44' to 44'11"	6	685,969.60
New boats 45' to 64'11"	5	1,804,483.20
Used boats to 39'11"	4	82,800.00
Used boats 44' to 44'11"	1	118,844.57
Diesel engines	29	494,627.04
Gas engines	5	31,052.00
Equipment	8	36,274.40
Aquaculture	8	501,830.33
	105	$5,670,410.35

Loans approved, by counties, were as follows:

	No.	Amount
Antigonish	6	68,346.24
Cape Breton	12	803,237.44
Cumberland	5	238,115.80
Digby	3	565,936.(
Guysborough	4	374,566.40
Halifax	20	1,074,749.28
Inverness	2	52,152.00
Lunenburg	7	356,598.97
Queens	4	195,581.28
Richmond	6	133,920.00
Shelburne	16	878,866.40
Victoria	1	23,040.00
Yarmouth	19	905,300.54
	105	$5,670,410.35

During the year, 18 loans were cancelled amounting to $851,388.25.

Technical and Inspection Services

During the year, 46 boats were completed with Loan Board financing. Technical services were provided during the preliminary planning and construction stages of these boats. Progress inspections were made by department staff on 48 boats. At the end of the fiscal year two of the boats were at various stages of construction and subject to further inspection. In addition, 41 used boats were inspected; 43 boats were inspected for engine and equipment loans and seven new boat shops and fibreglass moulds were inspected. Three new builders were added to the board's list of approved builders. Maintenance and housekeeping inspections were carried out on 836 boats. Twelve boats were re-inspected for various reasons. Six sea trials were held.

TRAINING AND FIELD SERVICE

Training

There continues to be a strong demand for courses in Net and Gear Technology, Engineering, Navigation and Safety. The demand for the programs comes from both the inshore and offshore fleets. The programs for the offshore fleets are comprised mainly of navigation and engineering courses which prepare the candidates to write for Transport Canada Certification. While there is no current regulation for Transport Certification within the inshore fleet, there is considerable interest in the safety and navigation training programs, leading to certification as Fishing Master IV.

The fiscal year 1986–87 saw a "first in Canada" when a class of seven captains graduated from the School at Pictou with a Fishing Master I certificate. This certificate is the highest level of achievement within the Transport Canada Certification program and has world-wide validity. Nine Canadian fishermen currently hold this certificate. There has been a steady demand for navigation upgrading programs for deck officers and courses to upgrade qualifications of engineers, together with a steady flow of new students preparing to enter into our officers positions.

The training programs were conducted at the School of Fisheries, Pictou and in 49 locations throughout the province.

For 1986–87, the Training and Field Service Division achieved the highest success rate in Transport Canada navigation certificate examinations. The results are as follows:

Transport Canada Certificate	Number of Courses	Number of Fishermen Passed
Fishing Master Class I	1	7
Fishing Master Class II	1	6
Fishing Master Class III	3	34
Fishing Master Class IV	21	235
Marine Emergency Duties (M.E.D.)	12	130

A strong emphasis has been and continues to be placed on safety programs. These programs include:

—First Aid
—Firefighting
—Life Saving and Survival
—Use of Survival Suits and Life Rafts
—Distress Signals

First Aid

	No. of Courses	Students Completed
Emergency First Aid	18	183
Mariner's First Aid	10	108
Standard First Aid	2	18

Extension Programs in Fishing Communities

The Extension Programs are designed primarily to meet the training needs of the inshore harvesting sector. The planning and coordination of these programs in the fishing communities are facilitated through the work of the Department's fishery representatives working in cooperation with Canada Manpower officials. Partial funding for the courses both at the school and for the extension programs is provided through Canada Employment and Immigration training funds.

The breakdown of the training programs conducted in the fishing communities is as follows:

	No. of Courses	Students Completed
Navigation	16	192
Inshore Fishing Operations	16	200
Marine Emergency Duties (M.E.D.)	23	276
Small Gas & Diesel	7	72
Deckhand/Trawlerman	3	34
Radio Telephone	1	15

Nova Scotia School of Fisheries, Pictou

The programs at the Nova Scotia School of Fisheries are designed primarily to meet the needs of the offshore fleet. They also serve to train fishermen in the local area. The courses conducted at the school are:

a) Nova Scotia Fishermen

	No. of Courses	Students Completed
Navigation	10	95
M.E.D.	5	46
Deckhand	1	10
Chief Engineer	1	10
Radio Telephone	1	12
Small Gas & Diesel	1	10

b) Fishermen from Overseas

Training programs for fishermen from overseas is arranged through a joint venture between the department and the Canadian International Development Agency (C.I.D.A./V.A.D.A.) and the International Centre for Ocean Development (I.C.O.D.).

Two programs were conducted during 1986–87. The first program was comprised of fishermen from St. Christopher, Antigua, Nevis and the British Virgin Islands. They participated in a six week program made up of four courses: diesel engine maintenance, net and gear technology, outboard engines, safety and navigation.

	No. of Courses	Students Completed
Diesel Engine	2	6
Net and Gear Technology	2	13
Outboard Engines	2	8
Safety & Navigation	2	10

A second group of fourteen fishermen from Barbados and St. Lucia participated in a five week program which included navigation, longlining and outboard engines. This program was funded through I.C.O.D.

	No. of Courses	Students Completed
Navigation & Safety	1	4
Longlining	1	5
Outboard Engines	1	5

c) Other Government Agencies—Department of Fisheries and Oceans

A one week navigation program was conducted for ten students from the Department of Fisheries and Oceans. The students engaged in the Fishery Observer Program.

d) Quality Control

Sixty participants followed courses in dockside grading which were held in Clark's Harbour, Cheticamp, Digby and Pictou. All students were successful in achieving certification. However, it is not known whether the DFO programs in dockside grading will be continued.

Training Summary

The following table indicates the extent of fisheries training programs conducted over the past five years for Nova Scotian fishermen.

	1982/83	1983/84	1984/85	1985/86	1986/87
Number of courses	77	65	76	71	69
Number of trainees	779	824	1,001	896	780
Number trained	763	824	1,001	896	780

Training for Nova Scotian fishermen normally takes place during the period September to March. From April to September, the school conducts training for other government agencies including the training for fishermen from overseas through the auspices of I.C.O.D. and C.I.D.A.

Plans are currently underway to expand our fisheries training into the Arctic with potential contracts in Baffin Island and Fort Chimo, Northern Quebec.

A summary of the training offered by the Training and Field Services Division is as follows:

	Inshore	Offshore	Processing
Navigation	Small Craft Master Fishing Master Class IV	Fishing Master I Fishing Master II Fishing Master III	
Engineering	Small Gas & Diesel Diesel Engines Hydraulics	Watchkeeping Engineer Fishing Vessel Chief Engineer 4th Class Engineer	Refrigeration for: Small Plant Operator Assistant to Plant Engineer
Fishing Gear Technology	Basic Skills in Repair & Construction	Deckhand Trawlerman	
Safety	Marine Emergency Duties I Fire Fighting, Life Saving, Survival First Aid	Marine Emergency Duties II Life Saving, Survival First Aid	
Business Practices	Family Business Recordkeeping Taxation Financial Decision Making		Small Plant Operator Recordkeeping Finance Management
Quality Control	Included in Fishing Gear Program	Included in Trawlerman Course	Production Staff Fish Buyers
Advisory Services	Fishing Gear & Engineering	Design of Special Programs	Design of Special Programs

FIELD SERVICE

The fisheries representatives serving fishing communities and industry throughout the province provided information and monitored the service of government programs in Industrial Development, Loan Board, Aquaculture, Marketing and Training.

Training programs for Nova Scotian fishermen at the school in Pictou and in fishing communities throughout the province were co-ordinated by the Field Service and Administration staff. The Field Service Division worked in consultation with Transport Canada and the Canada Employment and Immigration Commission in processing documents related to training and in arranging instruction facilities. The division also played a major role in the selection of students.

Applications to the Industrial Development Division for assistance, (described elsewhere in this report), were taken by the fisheries representatives and rated according to impact and priority in the industry. Several hundred applications were handled and progress on approved projects was monitored.

Confidential reports on loan applications were completed by the Field Service for the Fisheries Loan Board and assistance was given to fishermen in finding boat builders or used boats. Another significant function of the representatives involved encouraging fishermen to bring their loans up to date, supplying financial advice and additional loan information.

Aquaculture received increased emphasis from all members of the Field Service. More attention is expected to be given to both fin and shellfish rearing in the future as the Aquaculture Act and Regulations are promoted and enforced.

MARINE RESOURCES DIVISION

The Marine Resources Division represents the department and the fishing industry of the province on numerous government-industry advisory committees. Its function is to ensure that the needs of the industry are adequately considered in the development and implementation of management plans for the various fisheries in which provincial fishermen participate.

This year the division was represented on 46 official advisory committees dealing with groundfish, pelagics, scallops, marine plants and crustaceans. The division advised on many bilateral agreement discussions with foreign nations.

The division also represented the department on five offshore oil and gas committees. The Division Director is co-chairman of the joint Nova Scotia–Canada Fisheries Advisory Committee as provided for in the Canada–Nova Scotia Offshore Petroleum Resources Accord. Through the oil and gas committees, the department ensures minimal interference with the fishing industry as a result of offshore exploration and development. It interacts directly with the Canadian Oil and Gas Lands Administration along with other federal and provincial departments involved in authorizing offshore activity.

The Resource Management and Research section of the division is divided into three units, each dealing with a particular species group. This section includes resource management officers for groundfish, invertebrates and pelagic fish. As well as providing expertise in their specific fields for management of the resource, the latter two are involved in research programs investigating species and stocks of specific interest to Nova Scotia. These studies are important to the development of new fisheries for the future and to improved management for the present. These programs involve considerable field work for which students are employed. Details of these studies are as follows:

Invertebrates

In 1986, the division participated in port sampling programs collecting information on lobster and crabs at fishing ports around the province. Biological data including size frequencies, catch effort and reproductive potentials were gathered and will be used to assess the fisheries as they exist and to project how they may respond in the future. Special interest was given to lobster area 26 (formerly district 7b1.) where an

experimental size increase program was started. Over the next few years, the legal size of lobster in Inverness County will go from 2.5 to 2.75 inches. This change is expected to increase the yield from the local fishery and potentially increase recruitment.

Pelagic Fish

Departmental studies on the gaspereau stock of the Pictou Harbour region have provided biological information on habitat alteration and gaspereau production. Due to the recent modification of the Pictou Causeway Reservoir from a fresh water to a sea water environment, emphasis has been placed on the potential of the Middle River Reservoir for gaspereau production. In 1986, gaspereau population dynamics were examined using data from species composition, size and age frequency, and the movement of spawning fish into the reservoir. The early life history of gaspereau was investigated through sampling of larval and juvenile density, distribution and growth. Plankton productivity in the reservoir was also studied in relation to environmental factors.

AQUACULTURE AND INLAND FISHERIES

This division is responsible for the planning, implementation and administration of policies and programs aimed at conserving and enhancing the fisheries resource at the land-water interface. Major responsibilities include:

1) Administration of the Aquaculture Act and Regulations under which aquaculture licenses and leases are issued; and the Federal–Provincial Agreement on Aquaculture Development, which provides for coordination of departmental responsibilities and programs for the orderly development of this resource sector. A Federal–Provincial Industry Sector Committee, composed of representatives from all molluscan culture sectors and the Aquaculture Association of N.S., assists the two levels of government by providing ongoing advice to respective Ministers and by developing a long term Aquaculture Development Plan for the Province's Aquaculture Research Sector.

2) Management of the recreational trout fishery, which includes producing and distributing 1.2 million trout to some 220 rural and urban lakes across the province, conducting lake and stream surveys, creel censi, and other field and extension work which support the conservation and enhancement of the recreational trout fishery.

3) Providing departmental advice and technical expertise to provincial and federal agencies, intergovernmental committees and the public involved in the management of the resource base in the coastal zone.

4) Administrating and directing the implementation of applied research and development projects which support aquaculture development. These initiatives are carried out through the Federal–Provincial Regional Economic Agreement (Fisheries Sector).

5) Providing extension services to the public in the aquaculture and inland fisheries resource sectors through resource material, demonstration sites, on-site project evaluations and public seminars.

The divisional headquarters are maintained at the Fisheries School in Pictou, while the Aquaculture Coordinator is based in the Halifax office. Regional operational facilities include an experimental shellfish hatchery and shellfish culture demonstration site at Pleasant Point (Halifax County) and trout production facilities at Fraser's Mills (Antigonish County), St. Peter's (Richmond County) and McGowan Lake (Queen's County).

Aquaculture Development

This section provides field and extension support to people applying for aquaculture licenses and leases, as well as to operators. Services include site evaluations, water quality surveys, technical advice on culture methods and the production and sale of hatchery (finfish and shellfish) stock for start-up operations.

Site Inspections

This year, 120 requests from new mollusc aquaculturists were answered. Services included preliminary site inspection, water sampling and technical advice.

Shellfish Seed Stock Production

Seed sales to growers during the year was as follows:

Oysters:	
European	250,000 sold
Native	50,000 for department use
Quahaugs	10,000,000 sold
Bay Scallops	30,000 for experiment

Assistance to the Private Sector

A private company is establishing a commercial scale shellfish hatchery in Blandford, Lunenburg County, focusing on Bay Scallop and European oyster seed production. The company plans to eventually extend operations to include other shellfish and finfish species. The department assisted by providing technical advice and training in hatchery operations.

Research and Development

As part of its mandate to encourage aquaculture development in the private sector and to provide research and development support, the department conducted a number of experimental projects. With funding from the Federal/Provincial Economic Regional Development Agreement (Fisheries sub-agreement) and with the cooperation and recommendation of the Aquaculture Association of Nova Scotia, the department investigated the aquaculture development potential of the Bay Scallop and its capacity to survive and overwinter in our waters, as well

as the feasibility of bottom culture of the Blue Mussel. A manual for the design and operation of a small scale molluscan shellfish hatchery was also produced.

The following reports are available from the department:

- The Feasibility of Bay Scallop Culture in Nova Scotia
- Development, Criteria and Methods for the Bottom Culture of Blue Mussels
- Design of a Small Scale Shellfish Hatchery

Independently, staff carried out a review of literature and incorporated its own field data in a report entitled "A Review of Winter Nearshore Sea Temperature Data with Reference to Salmonid Sea Cage Farming."

Research and development related to improving molluscan shellfish hatchery production techniques continues at the Pleasant Point hatchery. This year's seed production focused on four species: the Bay Scallop, Bay Quahaug, European Oyster and the native oyster. Hatchery seed was distributed to private growers for assessing juvenile and adult growout potential.

In addition the hatchery continues its work on finding the most suitable cultch material for oyster spat setting, juvenile growth and separation. Large shell chips did not prove effective. Whole mussel shells will be tested in the coming year, along with the whole shell of other species.

Finfish Aquaculture

In providing extension services to finfish aquaculture, 27 site visits were conducted by departmental staff. Written and verbal responses serviced about 250 inquiries regarding commercial finfish aquaculture. The services of Dr. Robin McKelvie as the department's Fish Health Consultant, were made available to the industry.

Formal training sessions were organized at the Fisheries Training Centre, Pictou, with 27 participants attending a week-end workshop. Instructors included federal and provincial government scientists, as well as representatives from the trade service industries. In addition, a number of industry participants received specific training at our Frasers Mills hatchery at various times throughout the year. This service was provided free of charge.

This year, about 500,000 Rainbow and Speckled trout were sold to commercial aquaculturists as seedstock. In addition, some 50,000 Rainbow and Speckled trout were sold to recreational aquaculturists for use in private ponds.

The department operated a salmonid broodstock project at its Frasers Mills hatchery. Industry broodstock was picked up at the commercial site, trucked, spawned and returned. The resultant progeny eggs were partially developed (eyed) at Frasers Mills and then returned to the donor. The service was provided free of charge and is designed to assist the industry alleviate a temporary shortage. This year, 118,000 salmon eggs were produced under this project.

Inland Fisheries

Production and Distribution

Inland fisheries activities expanded during the year in response to increased demands from the recreational sector for enhancement efforts. In addition to using the hatchery facilities at Frasers Mills and St. Peters, the department contracted production work to four federal fish hatcheries. The planning phase for a new hatchery at McGowan Lake, north Queen's County, is well underway with full production expected for the fall of 1988.

Fish distribution was within the following program areas:

Fall fingerlings (wild replenishment) . . . . . .0.8 million/ 140 sites
Spring yearlings (urban recreational) . . . . .0.25 million/ 60 sites
Egg and fry (public participation) . . . . . .2.0 million/ 700 volunteers
Aquaculture (commercial) . . . . . .0.5 million/ 20 sites
(recreational) . . . . . .50,000/ 140 sites
Research . . . . . .15,000 trout

Research and Enhancement Programs

The division maintained the angling prohibition on Giant's, Sullivan and Magginist Lakes to permit the continued research on Speckled trout broodstock development.

Eight differing sources of wild Speckled trout broodstock were used in the continuing genetic research program conducted at the Frasers Mill hatchery facility. Some 16 genetic lines of both pure and hybrid progeny were produced for future research and enhancement efforts.

The department conducted detailed population estimates on 20 indexed streams selected as being representative of their area. This program provides an indication of the effectiveness of enhancement efforts and of the native population.

In its continuing efforts to document the resource base, the department detailed the physical habitat of about 300 kilometers of stream within the province.

MARKETING

This division provides services of a diverse nature to all levels of the fishing industry, as well as to the seafood retail sector, foodservice industry and the general public. Support services offered by the division are directed towards increasing sales potential of seafood and enhancing the marketing of seafood products to consumers.

Market Development and Promotion

General

The role of this section is to provide comprehensive and timely information to the fishing industry on seafood market opportunities worldwide, and to ensure that information on Nova Scotia seafood exporters and products is available internationally. The section also assists in the promotion of Nova Scotia seafood both within and outside the province.

Trade Issues

The department continued to monitor U.S. trade actions against fresh and salt fish from Canada. Final determinations were made on fresh fish and a countervailing duty levied on whole fish. Several companies requested reviews of the duties assessed on salt cod exports.

Seafood Publications

The selection and availability of promotional material was improved during the year with the addition of two new recipe pamphlets to the existing collection of sales aids. Materials developed focused on health aspects of seafood consumption particularly Omega-3. More than 600,000 recipe pamphlets, seafood posters and other promotional materials were distributed to retailers, food service operators and the general public during the year.

The Directory of Nova Scotia Fish Products and the Retail Outlets pamphlet are reprinted annually to reflect up-to-date information. The Directory is a buyers guide for seafood produced in the province and is distributed internationally. The Retail Outlets pamphlet lists the many outlets within the province where fresh and frozen seafood may be purchased by consumers.

Food Shows and Demonstrations

The department participated in Seafood '87 in Boston, the most important seafood trade show held in the United States. Nova Scotia companies participating were provided with display equipment and home economist services. This event continues to improve each year and is considered to be a highly effective trade show in relation to our significant market in the New England and Northeastern U.S. region.

Another major trade show was Seafare '87 in California, which involved four companies under the Nova Scotia Fisheries umbrella. This show also continues to grow every year.

The department's home economist continued to provide support services, such as seafood sample preparation for processors and exporters attending national and international food shows.

Within the province, the department conducted numerous seafood cooking demonstrations at exhibitions, shopping malls, consumer shows such as the Atlantic Winter Fair and Food Extravaganza, as well as other public events. Such promotions aim to increase the Nova Scotia consumer's awareness of seafood and how to prepare it. In addition, seafood information is frequently provided on radio shows aimed at the homemaker. Recipes and other helpful hints are carried by newspapers in the province. Retailing workshops were conducted for major supermarket chains which are in the process of expanding their seafood merchandizing efforts.

November Fish and Seafood Month

During November a major radio campaign focused attention on seafood. The promotion began with a media reception. Contests for the consumer were run in conjunction with the radio campaign, which urged consumers to make seafood a regular item in their menu planning.

Fishery Exhibitions

The department was represented at the Nova Scotia Fisheries Exhibition in Lunenburg. As well, small exhibits were placed in several community exhibitions, such as the North Sydney Wildlife Association show.

ADMINISTRATIVE SERVICES

This division provides administrative support to the department including financial, personnel and office services. Planning, economics, statistical services and data processing are also provided to the department.

Some of the major projects undertaken by the division during the year include:

Economic Studies and Projects

Fisheries Cost and Earnings Study

The cost and earnings study of fishing vessels in Nova Scotia is a joint project with the federal Department of Fisheries and Oceans. Information on capital and operating costs from a representative sample of fishing vessels in the province has been collected for the final year, ending a 10 year association of gathering such information with Federal Fisheries.

Information continues to be collected on a selective basis on scallop draggers in the province to provide a data base for this important sector of the fishery.

Clam Industry

An investigation was conducted into the Nova Scotia clam industry to identify its economic importance and the potential for provincial involvement in its regulation.

It was recognized that the clam industry represents an important industry valued at close to $3 million in reported 1986 landed value terms. It was also recognized that it would not be feasible for the province to become involved in resource conservation measures as regulatory tools. The Nova Scotia Fisheries Act, however, could add support and strength to the federal Department of Fisheries and Oceans' planned regulations on size limits and limited entry licensing.

Other Projects

Under the terms and conditions of the Federal–Provincial Agreement on Aquaculture Development, the department is responsible for the collection of aquaculture production statistics to be used by both levels of government in developing policies and programs to foster the aquaculture resource. In this regard, information was received from the industry showing 374 M.T. of aquaculture production in 1986 valued at $1,000,000.

Work was updated on a statistical profile of the Nova Scotia fishery to satisfy many requests for information on this industry. Topics contained in the profile included the fishery in relation to provincial Gross Domestic Product, landings, landed values and market values by species and counties, production and export statistics, data on employment earnings and processing establishments, and information on the fishing fleet.

Administrative Information and Control Systems

During the year, efforts continued to complete the move of the Fisheries Loans System to the government mainframe from the HP-250 based system. At year end, the new system had been designed, data had been transferred and parallel system testing was underway.

In consultation with the Department of Government Services and Management Board, an earlier decision to upgrade the HP-250 minicomputer to handle three new applications was altered to take advantage of personal computer technology. As a result, two IBM compatible personal computers were acquired and plans were formalized to acquire additional P.C.'s in future years.

Weatheradio Canada

This system is a cost-shared service, funded jointly by the department and Environment Canada. Marine and public forecasts are disseminated through a system of VHF radio stations in Nova Scotia and Prince Edward Island. This highly successful service has virtually eliminated complaints from fishermen concerning the availability of weather information. During the year, a rescheduling of forecast issue times was implemented to better serve the needs of the fishing community.

Nova Scotia Seafood Cookery

The department's publication *Nova Scotia Seafood Cookery* was sold out. Under the terms of a distribution contract with Formac Publishing Ltd., a second edition was to have been printed. The publishing company decided not to proceed with a reprint however. If a second edition is considered in the future, it will be subject to the conditions and structure of the provincial co-publishing policy.

Fishery Exhibition

During the year, the department was represented at the Nova Scotia Fisheries Exhibition in Lunenburg and the Atlantic Fisheries Trade Show. In addition, plans were being made in conjunction with the Department of Development for provincial participation in the First International Fishing Equipment Exhibition scheduled for Halifax.

STATISTICAL REVIEW

All fisheries production statistics given here for the calendar year 1986 are revised figures supplied through the courtesy of the federal Department of Fisheries and Oceans. They may be subject to minor adjustments as late returns from firms and individuals are received and processed in that department.

Nova Scotia Fisheries Major Species Landings of those Species Yielding Over One Million Dollars Annually

(Listed in Descending Order of Value in 1986)

	Landings (Metric Tons)		Value ($,000)	
	1986	1985	1986	1985
1. Lobsters	17,990	13,043	140,673	94,210
2. Cod	139,965	148,558	83,000	68,646
3. Scallops	49,298	38,331	63,021	49,363
4. Haddock	39,031	34,017	34,990	26,695
5. Herring	74,928	99,784	15,315	15,327
6. Pollock	42,315	41,503	16,064	10,668
7. Flounders	17,053	17,016	14,431	9,895
8. Halibut	2,533	2,988	12,372	10,514
9. Redfish	34,773	26,209	10,768	6,516
10. Swordfish	1,061	573	7,112	2,894
11. Shrimp	2,221	1,127	6,001	3,557
12. Hake	12,118	10,221	5,594	3,211
13. Crabs	2,389	2,784	4,528	3,769
14. Clams	1,968	1,498	2,758	1,631
15. Mackerel	3,877	6,043	1,217	1,676
16. Cusk	2,104	2,375	1,236	1,179

Table I

Nova Scotia Fisheries
Landed and Marketed Value
1950–1986

Year	(Value in $,000) Landed Value	Marketed Value
1950	21,400	38,819
1955	23,582	47,093
1960	26,094	51,753
1965	49,371	93,443
1970	55,652	105,939
1975	91,010	208,574
1980	230,911	438,799
1981	263,727	484,182
1982	259,411	523,191
1983	276,451	497,664
1984	265,335	533,500
1985	312,733	562,919
1986	423,973	805,548 (1)

(1) This is an estimate based upon recent average past relationships between landed and marketed values.

Table II
Nova Scotia Fisheries
Landings and Landed Value by Species Group

	Landings (Metric Tons)		Value ($,000)	
	1986	**1985**	**1986**	**1985**
Groundfish	294,687	286,886	181,038	138,703
Pelagic & Estuarial	82,793	107,807	24,899	20,444
Molluscs & Crustaceans	74,169	56,889	217,154	152,589
Miscellaneous (1)	11,789	9,652	882	997
	463,438	461,234	423,973	312,733

(1) Seaweeds, worms, tongues, roes, unspecified

Table III
Landed Value of Fisheries by Counties

County (1)	Landed Value (2) ($,000)		Per Cent Change (3)
	1986	1985	1985/86
Shelburne	87,705	68,975	+ 27.2
Lunenburg	77,802	52,577	+ 48.0
Yarmouth	52,851	41,790	+ 26.5
Digby	44,038	38,853	+ 13.4
Cape Breton	39,964	26,297	+ 52.0
Guysborough	28,233	25,247	+ 12.3
Halifax	20,872	13,582	+ 53.7
Queens	17,545	11,512	+ 52.4
Inverness	17,773	10,423	+ 65.0
Victoria	10,098	7,115	+ 42.4
Pictou	8,192	4,151	+ 98.0
Richmond	6,689	5,698	+ 17.4
Cumberland	4,478	1,594	+184.0
Antigonish	3,690	2,229	+ 65.6
Colchester	1,926	1,188	+ 62.1
Annapolis	1,232	963	+ 27.9
Kings	849	523	+ 62.3
Hants	36	16	+125.0
	423,973	312,733	+ 35.5

(1) Counties are in order of the 1986 landed value.

(2) Landed value includes groundfish, pelagic and estuarial, molluscs and crustaceans, viscera, seaweed and other.

(3) Increase (+)

Table IV
Total Landed Weight of Fisheries by Counties

County (1)	Landed Weight (2) (MT)		Per Cent Change (3)
	1986	1985	1985/86
Lunenburg	91,424	73,342	+ 24.7
Shelburne	71,207	72,993	− 2.4
Cape Breton	60,018	49,969	+ 20.0
Guysborough	57,613	60,558	− 5.0
Digby	53,253	66,038	− 19.4
Yarmouth	47,376	65,628	− 27.8
Inverness	18,050	13,579	+ 31.4
Halifax	16,703	15,472	+ 8.0
Queens	14,210	12,791	+ 11.1
Richmond	14,001	14,326	− 2.2
Pictou	6,750	4,706	+ 44.5
Victoria	6,659	6,774	− 0.7
Antigonish	2,841	2,777	+ 2.6
Colchester	1,125	856	+ 31.4
Cumberland	1,073	441	+145.1
Kings	573	388	+ 47.7
Annapolis	520	579	− 10.2
Hants	42	17	+147.0
	463,438	461,234	

(1) Counties are in order of the 1986 landed weight.

(2) Landed weight includes groundfish, pelagic and estuarial, molluscs and crustaceans, viscera, seaweed and other.

(3) Increase (+); Decrease (−).

Table V
Landed Weight and Landed Value of Fisheries
by Species Group by Counties
(1986–1987)

County	Species Group (1)	Landed Weight (Metric Tons)		Landed Value ($,000)	
		1986	1985	1986	1985
Annapolis	Groundfish	186	147	140	83
	Pelagic	2	–	3	–
	Shellfish	332	432	1,089	880
	Other	–	–	–	–
Antigonish	Groundfish	860	1,072	361	421
	Pelagic	1,395	1,181	334	228
	Shellfish	586	524	2,995	1,580
	Other	–	–	–	–
Cape Breton	Groundfish	53,799	44,881	30,048	19,012
	Pelagic	4,628	3,935	749	657
	Shellfish	1,622	1,148	9,157	6,616
	Other	5	5	11	12
Colchester	Groundfish	14	19	15	23
	Pelagic	25	11	23	13
	Shellfish	1,086	826	1,888	1,152
	Other	–	–	–	–
Cumberland	Groundfish	1	1	2	–
	Pelagic	86	152	57	47
	Shellfish	987	288	4,421	1,547
	Other	–	–	–	–
Digby	Groundfish	23,656	30,110	17,884	16,991
	Pelagic	18,048	25,872	3,901	3,839
	Shellfish	11,516	10,052	22,243	18,018
	Other	9	4	34	5
Guysborough	Groundfish	44,460	51,409	19,326	19,428
	Pelagic	8,740	7,923	1,395	1,085
	Shellfish	2,414	1,226	7,511	4,733
	Other	–	–	–	–

Halifax	Groundfish	13,827	12,187	13,118	8,188
	Pelagic	1,836	2,547	2,174	1,308
	Shellfish	1,039	738	5,580	4,086
	Other	—	—	—	—
Hants	Groundfish	18	4	13	2
	Pelagic	16	13	7	14
	Shellfish	8	—	16	—
	Other	—	—	—	—
Inverness	Groundfish	14,211	10,627	7,980	4,559
	Pelagic	909	447	367	114
	Shellfish	3,079	2,505	9,424	5,750
	Other	—	—	—	—
Kings	Groundfish	165	143	187	126
	Pelagic	356	214	199	136
	Shellfish	45	29	365	258
	Other	8	2	98	3
Lunenburg	Groundfish	57,860	46,741	30,415	16,690
	Pelagic	1,766	2,693	463	566
	Shellfish	31,848	23,908	46,923	35,321
	Other	—	—	—	—
Pictou	Groundfish	225	270	82	94
	Pelagic	4,655	3,590	1,014	635
	Shellfish	1,589	846	7,087	3,422
	Other	281	—	9	—
Queens	Groundfish	8,752	8,999	6,492	5,227
	Pelagic	452	778	196	160
	Shellfish	5,005	3,014	10,856	6,125
	Other	—	—	—	—
Richmond	Groundfish	13,345	13,506	4,782	4,169
	Pelagic	371	595	122	184
	Shellfish	285	225	1,785	1,344
	Other	—	—	—	1
Shelburne	Groundfish	47,169	53,581	39,144	35,760
	Pelagic	8,545	8,869	7,000	3,485
	Shellfish	4,912	3,811	40,972	29,228
	Other	10,632	6,732	592	502

Victoria	Groundfish	4,215	3,689	3,276	1,889
	Pelagic	1,206	2,138	382	563
	Shellfish	1,238	947	6,436	4,663
	Other	1	—	2	—
Yarmouth	Groundfish	9,925	9,498	7,774	6,041
	Pelagic	29,762	46,850	6,512	7,410
	Shellfish	6,580	6,372	38,405	27,865
	Other	1,110	2,908	160	474

(1) "Pelagic" includes pelagic and estuarial.
"Shellfish" includes molluscs and crustaceans.
"Other" includes liver, tongues, scales, roe and oil, sea plants, mammals, worms.

Table VI
Atlantic Provinces Landings and Landed Value—1986

	Landed Weight (Metric Tons)	Landed Value ($,000)
Nova Scotia	463,438	423,973
Newfoundland	502,635	199,903
New Brunswick	143,033	99,782
Prince Edward Island	45,801	62,206

Table VII
Nova Scotia Fishery Profile
Employment (1986/87)

Fishermen	14,835
Plant Workers—Yearly Average	9,300
Registered Fish Processing Establishments	235

The Nova Scotia Fishing Fleet
By Size and Vessel Categories (1986/87)

Inshore Fleet (Length/ft)	**Number of Boats**
Less than 20′	1,311
20′–24.9′	455
25′–29.9′ & 30′–34.9′	1,823
35′–39.9′	1,190
40′–44.9′	736
Total	5,515
Nearshore Fleet (Length/ft)	
Less than 45′*	244
45′–64.9′	207
Total	451
Offshore Fleet (Length/ft)	
65′+	163
TOTAL OF BOATS (ALL SIZES)	6,129

* Federal Fisheries and Oceans interprets the dividing line between the inshore and nearshore fleets as being under 25 gross tons. Therefore this category includes vessels over 25 gross tons. Source: Annual Statistical Review of Canadian Fisheries 1979–83.

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Deputy Minister	D.A. (Sandy) MacLean	Halifax
Secretary to the Deputy Minister	Miss M.L. Evans	Halifax

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Accounting Clerk	Miss N.A. Smith	Halifax
Clerk Typist	Miss S.J. Kane	Halifax
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Equipment Officer	F.S. MacKay	Pictou

Marketing Division

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Information & Promotions Officer	K.R. Weston	Halifax
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Resource Management Officer	R.H. Crawford	Halifax

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Biologist	A.G. Bagnall	Ostrea Lake
Maintenance Worker	R.A. Truen	Ostrea Lake
Hatchery Manager	D.A. MacLean	Fraser's Mills
Fisheries Technician	D.J. MacDonald	Fraser's Mills
Rearing Pond Attendant	D.D. Murrant	Fraser's Mills
Rearing Pond Attendant	D. MacGrath	Fraser's Mills
Hatchery Manager	M. McNeil	St. Peters
Rearing Pond Attendant	M. MacPhail	St. Peters
Rearing Pond Attendant	D. MacNearney	St. Peters

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Incentive Programs Assistant	Mrs. M.E. Meagher	Halifax
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Supervisor, Plants and Facilities	G.B. Scott	Halifax
Fisheries Technician	W.J. MacDonald	Halifax
Port Facilities Engineer	M.F. Giles	Halifax
Supervisor, Resource Technology	M.A. Drebot	Halifax

Nova Scotia Fisheries Loan Board

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Loan Officer	B.E. Cox	Halifax
Assistant Loan Officer	Mrs. L.M. Provender	Halifax
Technical Services Officer	M. Myketyn	Halifax
Fishing Vessel Inspector	B.G. Stockley	Halifax
Fishing Vessel Inspector	W.R. Buffett	Halifax
Fishing Vessel Inspector	T. Prewett	Halifax
Loans Administrator	E.J. Pellerin	Halifax

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Training

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Instructor (M.E.D.)	A.A. Kaiser	Pictou
Instructor (Navigation/M.E.D.)	D.B. MacCallum	Pictou
Instructor (Engines/M.E.D.)	J.W. Grant	Pictou
Instructor (Engines)	Ira Grant	Pictou
Instructor (Engines)	G. Gauthier	Pictou
Instructor (Business)	Miss B.J. Wright	Pictou
Instructor (Nets and Gear)	A.F. Tobey	Pictou
Maintenance Worker	E.G. Dalton	Pictou
Maintenance Worker	VACANT	Pictou
Chief Cook	Mrs. A. MacKay	Pictou
Housekeeping Aid	Mrs. L. Betts	Pictou

Field Services

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Fisheries Representative	A.P. Kehoe	Petit de Grat
Fisheries Representative	G.T. Boudreau	Little Dover
Fisheries Representative	G.C. Mossman	Rose Bay
Fisheries Representative	G. D'Entremont	Clark's Harbour
Fisheries Representative	A.J. Muise	Middle West Pubnico
Fisheries Representative	R.K. McDormand	Granville Ferry

Department of Fisheries
Ordinary Expenditures

Fiscal Year Ending March 31	Total Ordinary Expenditure
1966	$ 340,653
1967	321,742
1968	530,166
1969	412,577
1970	458,034
1971	1,020,778
1972	1,373,784
1973	908,457
1974	3,138,359(1)
1975	1,088,534
1976	661,763
1977	2,350,456
1978	3,149,131
1979	5,377,213
1980	5,841,649
1981	11,047,135(2)
1982	13,758,223
1983	12,642,688
1984	10,891,506
1985	11,496,630
1986	9,482,968
1987	7,964,297

(1) More than $2 million was spent in the form of special assistance to help the industry recover from a storm in June 1973.

(2) Beginning in 1981, capital advance interest charges for the Fisheries Loan Board are included in the Department of Fisheries estimates. These charges were previously accounted for under Department of Finance estimates.

Organizational Chart Department of Fisheries